

# Heritage (Decision about Registration of Tuggeranong Parkway Road Cutting) Notice 2011

Notifiable Instrument NI 2011 – 113

made under the

*Heritage Act 2004* section 42 Notice of Decision about Registration

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**1. Revocation**

This instrument replaces NI 2010 – 338

**2. Name of instrument**

This instrument is the Heritage (Decision about Registration for Tuggeranong Parkway Road Cutting) Notice 2011

**3. Registration details of the place**

Registration details of the place are at Attachment A: Register entry for the Tuggeranong Parkway Road Cutting.

**4. Reason for decision**

The ACT Heritage Council has decided that the Tuggeranong Parkway Road Cutting meets one or more of the heritage significance criteria at s 10 of the *Heritage Act 2004*. The register entry is at Attachment A.

**5. Date of Registration**

10 March 2011

Gerhard Zatschler  
Secretary  
ACT Heritage Council  
10 March 2011

Attachment A

 <p>ACT Heritage Council</p>	<p><b>AUSTRALIAN CAPITAL TERRITORY</b></p> <p><b>HERITAGE REGISTER</b> <b>(Registration Details)</b></p> <p><b>Place No:</b></p>
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*The following is mandatory:*

For the purposes of s. 41 of the *Heritage Act 2004*, an entry to the heritage register has been prepared by the ACT Heritage Council for the following place:

Tuggeranong Parkway Road Cutting: Section 81 Blocks 5, 3 and 7, district of Western Creek, division of Weston and Section 106 Part Block 12 district of Woden Valley, division of Curtin.

**DATE OF REGISTRATION**

Notified: 11 March 2011 Notifiable Instrument: 2011/

Copies of the Register Entry are available for inspection at the ACT Heritage Unit. For further information please contact:

The Secretary  
ACT Heritage Council  
GPO Box 158, Canberra, ACT 2601

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## IDENTIFICATION OF THE PLACE

Tuggeranong Parkway Road Cutting (Weston and Curtin) is located on the western side of the Tuggeranong Parkway north of Heysen St, Weston. The geological feature is also displayed on the eastern side of the parkway (see map entitled 'Tuggeranong Parkway Road Cutting Weston and Curtin').

**Division of Weston** – Road cutting and curtilage adjacent to Section 81 Blocks 5, 3 and 7

**Division of Curtin** – Road cutting and curtilage adjacent to Section 106 Part Block 12

**Note:**

*Related elements of this geological formation are also found north and south of the listed Place at the following locations (see Section non-statutory background information):*

**Division of Weston** – Section 71 Block 25, Section 86 Block 1, Section 90 Block 1, Section 91 Block 1

**Division of Lyons** – Section 58 Block 1, Section 61 Block 5

**Division of Waramanga** – Section 48 Blocks 2, 4 and 5

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## STATEMENT OF HERITAGE SIGNIFICANCE

The Tuggeranong Parkway Road Cutting is significant for the interpretation of the volcanic stratigraphy of the Canberra area during the Silurian period (around 400 million years ago). It demonstrates the relationship between volcanic ash flows and contemporaneous sediments.

Due to the extensive nature of the Cutting, the exposure is a valuable example of the types of geological contacts that can occur between sedimentary and volcanic rocks. It is difficult to demonstrate such contacts in small exposures.

This site is important for both scientific study and teaching, and has played an important role in re-interpreting the volcanic history of the Canberra area

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## FEATURES INTRINSIC TO THE HERITAGE SIGNIFICANCE OF THE PLACE

The features of the Tuggeranong Parkway Road Cutting that particularly reflect its heritage significance are:

- Geological formation showing the relationship between volcanic ash flows separated by inter-bedded waterlain sediments in the lower part of the Deakin Volcanics.

- Rock formation showing folds and fractures from tectonic movement where there was once a horizontally stratified sequence of sedimentary and volcanic layers. This feature includes rock layers as follows:
  - weathered volcanic rock formed by a dacitic ashflow, made up mostly of particles of the minerals quartz and feldspar (lowermost unit).
  - sedimentary deposition of white and purple sandstone with coarse grains of quartz polished by river and wave action
  
  - volcanic, banded rock of second episode of ashflow
  
  - sedimentary deposition in layers of grey and purplish red sandstone and shales with penetration into the older volcanic rocks with in-filled cracks and joints
  
  - volcanic, banded rock of third episode of ashflow, short period of sandstone and shale sedimentary deposition and volcanic rock of fourth ashflow. The contacts (place of contact where the different layers of rock type meet) between the layers in this section are severely disturbed and disrupted, showing the speed and force of the ashflow

<sup>NB:</sup>This physical description corresponds directly to the cutting in Section 81 (Division of Weston), but only generally to the cutting in Section 106 Block 12 (Division of Curtin). See 'Description of Place' section for further information.

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## **REASON FOR REGISTRATION**

Tuggeranong Parkway Road Cutting (Weston and Curtin) has been assessed against the heritage significance criteria and been found to have heritage significance when assessed against two criteria under the ACT Heritage Act.

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## **ASSESSMENT AGAINST THE HERITAGE SIGNIFICANCE CRITERIA**

Pursuant to s.10 of the *Heritage Act 2004*, a place or object has heritage significance if it satisfies one or more of the following criteria. Significance has been determined by research as accessed in the references below. Future research may alter the findings of this assessment.

- (i) it is significant for understanding the evolution of natural landscapes, including significant geological features, landforms, biota or natural processes

The Tuggeranong Parkway Road Cutting geological feature helps illustrate the evolution of ACT's current landscape and the importance of the volcanic stratigraphy of the area. Due to its scale and quality, this geological feature clearly demonstrates important relationships between contemporaneous sedimentary and volcanic rocks.

- (j) it has provided, or is likely to provide, information that will contribute significantly to a wider understanding of the natural or cultural history of the ACT

because of its use or potential use as a research site or object, teaching site or object, type locality or benchmark site

This site is significant for both scientific study and teaching, and has played an important role in re-interpreting the volcanic history of the Canberra area. It clearly shows the contacts between volcanic and sedimentary rock demonstrating the relationship between these processes over geological time. It is an example that cannot readily be accessed elsewhere.

The following criteria were found not to be applicable:  
a,b,c,d,e,f,g,h,k,l(i)(ii)(iii)(iv).

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## **SUMMARY OF THE PLACE HISTORY AND PHYSICAL DESCRIPTION**

### **Context**

The evidence of past events preserved in the ancient rocks of the Tuggeranong Parkway Road Cutting, give a view far back into the early geological history of the Canberra region. The clues contained in the rocks reveal the existence of a former land, more than 400 million years ago, which had a very different appearance to that so familiar today.

In the west, at the present site of the Brindabella ranges and beyond, rose the high peaks of volcanoes which erupted at intervals with explosive force. They ejected dense clouds of hot volcanic particles and gasses, which, mixed together, descended like avalanches (ashflows) to the lower parts of the land and covered it repeatedly to a considerable depth.

During periods of volcanic inactivity eastward-flowing streams and rivers re-established themselves and washed sediments from the higher ground to blanket the volcanic rocks and to form layered deposits in lakes and in the sea. A fluctuating seashore was at times located in or near the Canberra area and formed the eastern coastline of the Australian continent.

### **Section 81, Blocks 5, 3 and 7**

The Tuggeranong Parkway Road Cutting, along the entire length of Section 81, shows a sequence of rocks that are part of the Deakin Volcanics. They were formed close to 420 million years ago during the Silurian age. The geological formation is largely made up of dacitic ashflows and lavas, the products of eruptive centres that once occupied the present site of the Brindabella Ranges. Sedimentary rocks, deposited during periods of volcanic inactivity, form a lesser part of the succession.

The most significant geological features of this formation are best displayed in the rocks outcropping in the road cutting of Block 5 (See attached photographs and also map entitled 'Tuggeranong Parkway Road Cutting Weston and Curtin'). They reveal evidence of four episodes of violent volcanic activity alternating with quiescent period when rivers deposited sandstones and shales in lakes and on beaches.

The northern end of the cutting shows a rather weathered, brownish volcanic rock made up mostly of the minerals quartz and feldspar. A sequence of layered, quartz-rich, purple sandstones, which overlie the lower unit, indicates a temporary cessation of volcanic activity. During this interval newly established rivers removed large amounts of the eruptive material and deposited it in deltas and on beaches to form sandstone. It has been suggested that the sandstone formed along a shoreline in the delta of an ancient river that drained the volcanic hinterland.

The volcanic rocks that cover this sandstone in the cutting to a depth of 50 meters give some indication of the renewed power and productiveness of these ancient volcanoes. The eventual, but temporary, exhaustion of their supply of material allowed the re-establishment of rivers and the further deposition in lakes and valleys of the thinly-bedded, grey and purple sandstones and shales, about 40 meters in thickness, which are seen to overlie the volcanic rocks in the road cut. The sea, at that time, had receded and had shifted the continent's coastline further to the east.

The continuing outcrop shows evidence that the sedimentary rocks were once again covered by a fresh eruption of volcanic material which, in turn, is overlain by more sandstone and shale.

The contacts between the volcanic and the sedimentary rocks are often markedly uneven, indicating that fast-moving ashflows disturbed the surface over which they flowed and ripped up large fragments of sedimentary rock. As they descended from the higher ground they ripped up large fragments of the sedimentary layers over which they passed and gouged furrows into the soft ground. We can see the results of this ancient devastation in the form of the contorted upper parts of the sedimentary units and in the presence of dislodged sandstone and shale fragments now incorporated in the basal parts of the volcanic rocks. Cracks which opened on the top of ashflows were later filled with sedimentary material.

The rocks seen in the cutting originally formed a horizontally stratified sequence, but due to later tectonic activity are now inclined towards the southwest. Some near vertical fractures or faults have disrupted the continuity of the layers.

The outcrops that mark the margins of Blocks 3 and 7 are entirely composed of volcanic rocks, indicating a very long period of sustained volcanic activity.

## **Section 106, Block 12**

Outcrops of rock are seen in the road cut along about one third of the section, at its southern end only. They also belong to the Deakin Volcanics and represent a repetition of the sequence described in Section 81. The various rock units, both volcanic and sedimentary, now concealed, cross the Parkway obliquely to reappear in the road cut opposite. Every rock unit seen to the western side of the road can also be recognised on its eastern margin. As neither the individual ashflows nor the sedimentary sequences have a constant lateral thickness, there are small variations in the two sections. The various features noted at the contacts between the two major rock types are also present but seemingly less easy to recognise than in the outcrops of Section 81.

## References

Abell, Robert. S. 1991 'Geology of the Canberra 1: 100 000 Sheet Area, BMR Bulletin 233.

National Capital Development Commission 'Sites of Significance in the ACT – Vol 4. Woden, Tuggeranong and Associated Areas, Technical Paper 56, February 1988

Owen, M. 'Geological Monuments in the Act' (Geological Society of Australia for the Australian Heritage Commission) 1987

Strusz and Henderson, 1971 (Details of Ref not in Nomination)

## **NON-STATUTORY BACKGROUND INFORMATION**

### **Historical Background**

The geological significance of the contacts found in the Weston section of the Tuggeranong Parkway Road Cutting was discovered in 1976. George Walker, considered to be a world authority on geology was attending the major international geological conference in the ACT. During a field trip the cutting was recognised for displaying the geological processes of volcanic and sedimentary deposits clearly laid down in the rock, shown in the contacts between these two rock types. Owen then later documented this discovery in the report 'Geological Monuments in the ACT'.

Originally the Deakin Volcanics were regarded as the lower of the two formations of the 'Red Hill Group', with the Yarralumla Formation being the smaller upper layer (Öpik, 1958). Later this was redefined such that the Deakin Volcanics comprised most of the 'Red Hill Group', with the Yarralumla Formation being enclosed within the lower part (Strusz and Henderson, 1971).

In 1980, Owen and Cas and Henderson in 1981 then abandoned the 'Red Hill Group' and referred to the Deakin Volcanics as the oldest volcanic formation in the Laidlaw Suite. The Deakin Volcanics form the upper and lower part of the group with the lower part referred to as the Mount Painter Volcanics. The Yarralumla Formation occurs as the 2<sup>nd</sup> layer and the 3<sup>rd</sup> is the Mugga Mugga Porphyry Member which is the only named member of the Deakin Volcanics.

Originally the suburb of Deakin was classified as the type locality for the Deakin Volcanics (Öpik 1958). However, the Tuggeranong Parkway Road Cutting was later defined as the type locality for the Deakin Volcanics which means that this is the benchmark site for assessment of the Deakin Volcanics. The cutting between Hindmarsh Drive and the Cotter Road overpass exposes the Deakin Volcanics almost continuously over a distance of about 2 km (Abell 1991).

The length of the Tuggeranong Parkway Road Cutting was assessed from the Cotter Road in the north to the bend in Badimara St Waramanga adjacent to the parkway in the south. This includes all the sections previously nominated to the ACT Heritage Register.

### **Additional areas of interest**

In addition to the sections included in this citation, two extra sections (below) also illustrate the features of the Tuggeranong Parkway Road Cutting.

#### **Weston/Lyons –**

Division of Weston – Section 71 Block 25, Section 86 Block 1, Section 90 Block 1,  
Section 91 Block 1  
Division of Lyons – Section 58 Block 1, Section 61 Block 5

#### **Waramanga –**

Division of Waramanga – Section 48 Blocks 1 (may now be block 2), 4 and 5

The sections display the contacts between volcanic and sedimentary rock as a significant geological feature. There were no further obvious examples found along the length of the cutting. However, it is possible that a more detailed examination

would uncover less obvious and isolated examples of this geological feature scattered along the length.

It may be that the sections included in the citation were identified due to them making up part of the same rock formation, the Deakin Volcanics and the area being the type locality for this rock type.

## APPENDIX A



Contact of volcanic and sedimentary rock displayed in the western section of the Tuggeranong Parkway Road Cutting. Sedimentary layer seen in a line diagonally across the upper centre of image and as in-fill of a crack in volcanic rock bottom centre of image.



Contact of volcanic and sedimentary rock also displayed in the western section of the Tuggeranong Parkway Road Cutting. Upper layer sedimentary, lower layer volcanic.